

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
5 July 2001 (05.07.2001)

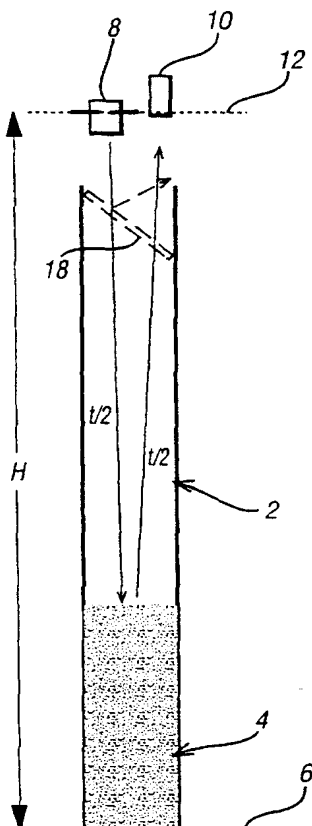
PCT

(10) International Publication Number  
**WO 01/48704 A3**

- (51) International Patent Classification<sup>7</sup>: **G07D 1/00**,  
G01S 15/10
- (21) International Application Number: PCT/GB00/04979
- (22) International Filing Date:  
22 December 2000 (22.12.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
9930522.9 23 December 1999 (23.12.1999) GB
- (71) Applicant (for all designated States except US): **MARS, INCORPORATED** [US/US]; 6885 Elm Street, McLean, VA 22101-3883 (US).
- (72) Inventors; and  
(75) Inventors/Applicants (for US only): **FURNEAUX, David, Michael** [GB/GB]; 12 Chalgrove Way, Emmer Green, Reading, Berkshire RG4 8SJ (GB). **CAMPBELL, Bernard, Joseph** [GB/GB]; Woodley Cottage, Sherfield Green, Sherfield-on-Loddon, Hampshire RG27 0ED (GB).
- (74) Agents: **BURKE, S., D.** et al.; R.G.C. Jenkins & Co., 26 Caxton Street, London SW1H 0RJ (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

[Continued on next page]

(54) Title: VENDING MACHINES AND COIN HANDLING APPARATUS



(57) Abstract: An electrical discharge produces an acoustic impulse, and a reflection of the impulse from the upper coin in a coin stack is sensed so that the level of the coin stack can be determined from the time taken for the reflection to be received. Alternatively, or additionally, the acoustic impulse can be used to detect coin jams, the presence and/or width of a coin store, the state of a coin routing gate or the quantity of a vendible product.

WO 01/48704 A3



(84) **Designated States (regional):** ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(88) **Date of publication of the international search report:**  
6 December 2001

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

— with international search report

# INTERNATIONAL SEARCH REPORT

In ternational Application No

PCT/GB 00/04979

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G07D1/00 G01S15/10

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G07D G07F G01F G01S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, IBM-TDB, INSPEC, COMPENDEX

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 774 841 A (CHADWICK NEVILLE D) 4 October 1988 (1988-10-04) cited in the application	25,29-31
A	the whole document	1-24, 26-28, 32,33
X	DE 197 14 799 A (DICKE KRISTIAN DR ING) 15 October 1998 (1998-10-15) abstract	30,33
A	US 4 590 975 A (CREDLE JR WILLIAM S) 27 May 1986 (1986-05-27) abstract	25-33
	column 5, line 55 -column 6, line 13	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*G\* document member of the same patent family

Date of the actual completion of the international search

6 July 2001

Date of mailing of the international search report

12/07/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Van Dop, E

# INTERNATIONAL SEARCH REPORT

Information on patent family members

In ternational Application No  
PCT/GB 00/04979

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4774841 A	04-10-1988	DE 3750521 D	20-10-1994
		DE 3750521 T	12-01-1995
		EP 0247785 A	02-12-1987
		ES 2060599 T	01-12-1994
		GB 2190749 A, B	25-11-1987
DE 19714799 A	15-10-1998	DE 29710367 U	25-09-1997
US 4590975 A	27-05-1986	NONE	